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December 11, 2009

Township Supervisor  
Attn: Frank Force  
12050 Old Belding Road  
Belding, MI 48809-9318


*Grattan Township and Grattan/Vergennes Sewer Systems Monthly Report  
November 2009*

Dear Frank,

Attached please find the Grattan Township Wastewater Utilities Report and the Preventative/Corrective Maintenance Report for November 2009.

As always I would be happy to elaborate on any of the submitted information or provide any additional information that would assist the township board. If there are any questions or concerns please do not hesitate in contacting me.

Sincerely,



John Rydbeck  
(616) 890-5768  
Infrastructure Alternatives  
Grattan Township Sewer System Operator

Attachments: November 2009 Preventative/Corrective Maintenance Report

## Grattan Township Sewer System

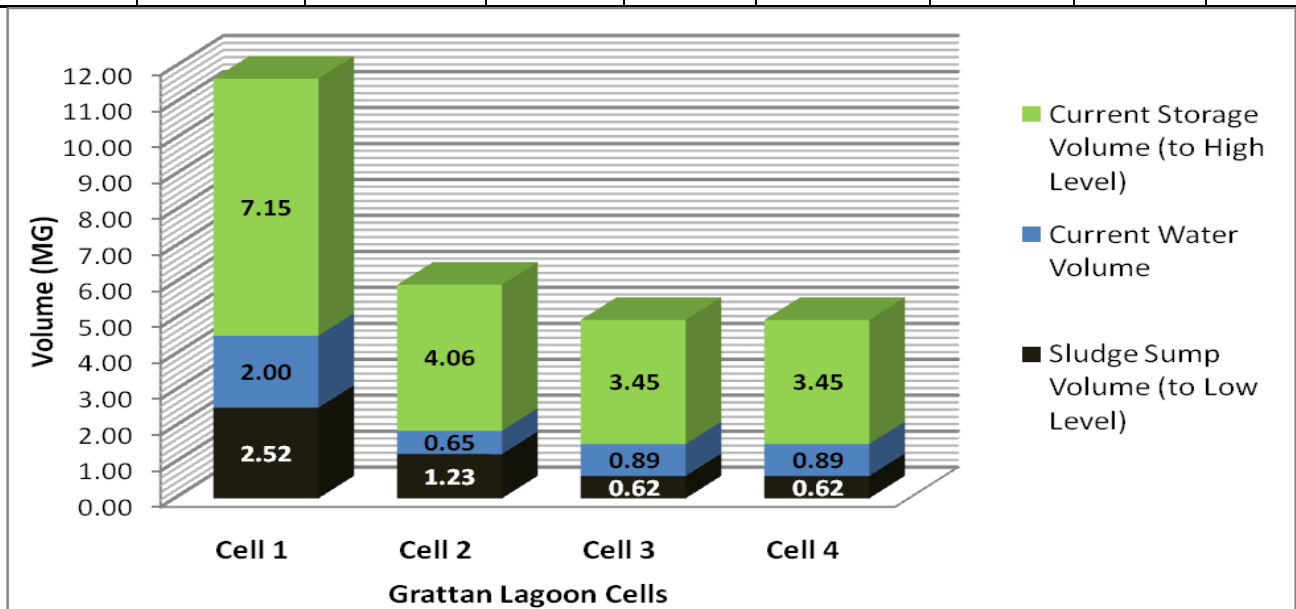
### Executive Summary:

A total of 3.925MG was discharged through the Grattan Township WWTF Irrigation system. This was far less than the extended irrigation season and Old Orchard discharge permitted amount for the month (56% of 6.971MG). There were six days of non-irrigation in the primary irrigation field as it was dried and tilled for the year and one rain-day that was not made up later in the month. The irrigation season was winterized starting November 24 due to potential damage from forecasted freezing temperatures, leaving seven non-irrigation days at the end of the month.

Two grab samples were collected from the discharge lagoon were collected and analyzed per the requirements in the NPDES permit. In addition, the monitoring wells were sampled and tested to complete the 4<sup>th</sup> Quarter Groundwater monitoring data. All under-drains were also inspected and recorded for any observation of flow.

A snapshot of the individual and total lagoon volume and storage for November 25, 2009 are shown below. More detailed weekly data can be prepared on request. The daily flow from BPI-PS #1 along with weekly lagoon levels will be recorded and plotted during the time of storage.

Nov. 25, 2009 Lagoon Levels	Feet Below Transfer / Pumping Structure Grating	Water Elevation (Top Structure Grating= 905.5')	Current Total Volume*	Low Water Volume (Sludge Sump)*	Current Water Volume (Current Volume Minus Sump Volume)*	Current Storage Volume (To High Water Level)	Total WWTF Current Volume	Total WWTF Storage Volume (to High Water Level)
Cell 1	7.44 ft	898.06 ft	4.52 MG	2.52 MG	2.00 MG	7.15 MG	9.42 MG	18.11 MG
Cell 2	7.87 ft	897.63 ft	1.88 MG	1.23 MG	0.65 MG	4.06 MG		
Cell 3	10.87 ft	894.63 ft	1.51 MG	0.62 MG	0.89 MG	3.45 MG		
Cell 4	10.87 ft	894.63 ft	1.51 MG	0.62 MG	0.89 MG	3.45 MG		



\*Data obtained from Prein&Newhof Lagoon Volume Calculator.

**Emergency Call-Outs:**

- Saturday November 7, 2009 @ 7:00 a.m. – 1:30 p.m. Grattan & Grattan/Vergennes Collection System Scheduled Power Outage: Consumer's Energy had scheduled power outage to begin at 8:00 a.m. and last until 4:00 p.m. IAI personnel arrived early to pump down all stations to low level prior to line-power loss. However, Consumers Energy never affected any of the pump stations in either collection system.
- Saturday November 21, 2009 @ 5:00 p.m. – 7:00 p.m. BPI-PS #3 ALARM LIGHT ON: Received a phone call from the answering service regarding a resident's observation of the alarm light on at Big Pine Island Pump Station #3. IAI arrived on-site to find the station in normal operation. The cause for this alarm is to be investigated next week. After verifying that the high level alarm and dialer are operating correctly, the light was temporarily disconnected to eliminate future false alarms from residents.
- Sunday November 29, 2009 @ 2:30 p.m. – 4:30 p.m. BPI-PS #2 HIGH LEVEL ALARM: Received a High Level Alarm from Big Pine Island Pump Station #2 Mission Dialer. Arrived on-site to find that the station received a momentary slug flow which triggered the Lag Pump On Float to switch the second pump on. In this station, the Lag Pump On Float is also the High Level Float, which thus caused the call-out. Since the station lacks an alarm light locking relay, the alarm input recognition time will be slightly increased from the previously set 0min; 3sec to 3min;0sec. The long term solution would be the installation of a designated float for High Level Alarm.

**General Operation Information / Housekeeping:**

- None

**Preventative Maintenance:**

- The preventative maintenance tasks have been completed for November 2009 and summarized in the attached report.

**Corrective Action / Significant Tasks Completed:**

- Wednesday November 25, 2009 BPI-PS #3A: Pump #1 of BPI-PS #3A was MEGGED to verify that the pump motor was in good condition. Recent motor overload trips (previously thought to be from a lack in ambient temperature compensation) have recently been linked to motor winding deterioration (i.e. ML-PS #4 Pump #1). However, the motor was found to be in good condition.
- Tuesday November 24, 2009 GRATTAN WWTF: Al Evink of Maintech instructed IAI personnel on the proper procedure to winterize the Grattan WWTF Irrigation System(s). The procedure was fully executed on Wednesday November 25 and November 30, 2009. This procedure will also be formally documented to be used as a reference for the plant's operation and maintenance.

**Pending Projects:**

- Two (2) failed gate valves from Cell #4 to the pumping structure will be replaced this fall.
- The unreliable controls in BPI-PS #3 will be replaced with a Motor Pump Controller operating from a pressure transducer with float switches for redundancy in both alarms and controls.

## Grattan/Vergennes Township Wastewater System

### Executive Summary:

There was no discharge/irrigation from the Grattan/Vergennes WWTF due to the permitted application season being completed in October 2009. The lagoons are currently being monitored weekly for lagoon elevations, as well as daily flow reporting from the BCL-PS #1.

The discharge lagoon was not sampled in the month of November from the lack of discharge during the month. However, the monitoring wells were sampled and tested to complete the 4<sup>th</sup> Quarter Groundwater monitoring data. All under-drains were also inspected, flow rates recorded, and discharge sampled according to the NPDES permit parameters.

### Emergency Call-Outs:

- Sunday November 1, 2009 @ 9:00 a.m. – 3:00 p.m. Murray Lake POWER OUTAGE ML-PS #5; ML-PS #6; ML-PS #7; ML-PS #8; ML-PS #8A; ML-PS #9; ML-PS #10; ML-PS #11; ML-PS #12; ML-PS #13 POWER OUTAGE: Power loss alarm calls from most of Murray Lake Pump Stations due to fallen power pole (from a fallen tree) on Lally Drive (in wetland area). Power restored to all stations except ML-PS #6 and ML-PS #5 by 1:30 p.m. Left portable generators at both stations to provide standby power until consumer's power was restored.
- Monday November 2, 2009 @ 2:00 a.m. – 4:30 a.m. Murray Lake ML-PS #6 Portable Generator PHASE LOSS: Call from ML-PS #6 with a phase loss, currently energized by portable generator. Consumers Energy had restored power so line-power was restored. The portable generator will be going to Bridgeway power for servicing on Tuesday.
- Saturday November 7, 2009 @ 7:00 a.m. – 1:30 p.m. Grattan & Grattan/Vergennes Collection System Scheduled Power Outage: Consumer's Energy had scheduled power outage to begin at 8:00 a.m. and last until 4:00 p.m. IAI personnel arrived early to pump down all stations to low level prior to line-power loss. However, Consumers Energy never affected any of the pump stations in either collection system. During this time, one station (5MILE-PS #3) did not have the controls returned to automatic mode and the alarm call-out was recognized within a batch of low level alarm call-outs. A small sewer back-up affected three houses, and each of the residents received prompt and comprehensive service to restore any damage and peace of mind. Consequently, all Sensaphone Dialers in both systems now have standardized alarm inputs to easily recognize the alarm condition. In addition, the alarm input recognition time on the dialers now match (or precede) the alarm light locking relays to eliminate the need for residents to monitor and report any alarm lights that remain on for extended periods of time. The Grattan specific parameters have been placed in a table to be included with every operator's emergency response folder. None of the labor or costs incurred during the incident itself, and its follow-up, were billed to Grattan Township.
- Monday November 16, 2009 @ 7:40 a.m. – 8:10 a.m. ML-PS #11 HIGH LEVEL ALARM: High level alarm call from Murray Lake Pump Station #11 Mission dialer due to suspected slug flow. Monitored the station remotely using the Mission software. The station quickly returned to normal operation.
- Tuesday November 17, 2009 @ 6:00 p.m. – 7:30 p.m. ML-PS #9 HIGH LEVEL ALARM: High level alarm call from Murray Lake Pump Station #9 Sensaphone dialer. Arrived on-site to find the station in normal operating condition. Pump #1 overloads were tripped and manually reset. Both

pump's amperage testing were found to be consistent with previous measurements and within tolerances. The station was visited the following day and found to still be in good operation.

- Wednesday November 18, 2009 @ 5:15 a.m. – 5:45 a.m. ML-PS #11 HIGH LEVEL ALARM: High level alarm call from Murray Lake Pump Station #11 Mission dialer due to suspected slug flow. Monitored the station remotely using the Mission software. The station quickly returned to normal operation.
- Sunday November 22, 2009 @ 1:30 p.m. – 3:00 p.m. 5MILE-PS #15 HIGH LEVEL ALARM: High level alarm call from 5MILE Pump Station #15 Mission dialer due to slug from Ratigan Lake Pump Station #16. Although one pump in the station has been recently re-built, the pumping capacity is still only ~50% of design. A larger impeller has been ordered for the 3HP Myers Grinder Pumps to hopefully increase the pumping capacity without replacing the pumps.
- Thursday November 26, 2009 @ 1:00 p.m. – 4:30 p.m. ML-PS #11 LOW LEVEL ALARM: Low level alarm from Murray Lake Pump Station #11 Mission dialer was received earlier in the day. This is atypical of the alarm calls received from this station, so IAI physically inspected the station instead of monitoring the Mission Communication System. It was found that the pump-off float was being pinned by a pump cord. Both the pump cord and float were re-positioned and the station continued normal operation. The low-level float performed its operation of turning off the pumps to prevent them from overheating or becoming air-locked.
- Friday November 27, 2009 @ 11:00 a.m. – 1:30 p.m. ML-PS #6 ALARM LIGHT ON: Received a phone call from the emergency answering service regarding a resident observing the alarm light on at ML-PS #6. IAI arrived on-site to find that the pump station was at a normal level, however the pump controls were operating erratically. Despite the recent controls troubleshooting performed on the station by an electrician on Wednesday November 25, 2009, the controls were still not performing correctly. Through additional investigation, the Lag Pump On ISR was disconnected and the station returned to normal pump on/off cycles. On a follow-up visit (November 30, 2009), the lag float was found to actually be the culprit. The entire controls will be replaced with a Motor Pump Controller operating from a pressure transducer with float switches for redundancy in both alarms and controls.

#### **General Operation Information / Housekeeping:**

- Work began on replacing two failed valves in the Grattan/Vergennes WWTF. However, after entering the valve pit it was noticed that the gate valves were in good condition. The failure occurred from the attachment of the operating nut and extension arm. The original bearings installed on the arm extension were also found to be seized-up. Parts are currently being gathered to make the necessary repairs.
- Spare Rotophase motor was checked for operation and had new wire leads installed (Fixall: \$158).

#### **Preventative Maintenance:**

- The preventative maintenance tasks have been completed for the month November 2009 and summarized in the attached report.

#### **Corrective Action / Significant Tasks Completed:**

- Tuesday November 3, 2009 BCL-PS #14: Re-built Pump #1 was installed in BCL-PS #14. The 3HP Myers Grinder pump has a new shredding ring, new cutters, new seal, new bearings, new gaskets, and a re-wound motor (Fixall Electric: \$1,837.89).

- Tuesday November 3, 2009 BCL-PS #17: Pump #2 from BCL-PS #17 had a new lower radial cutter, upper axial cutter, and stationary cutting ring replaced (Kerr Pump Parts: \$1,029.51). The pump seal chamber and motor chamber were drained and re-filled. Pump was placed back in to the pump station on Wednesday November 18, 2009.
- Friday November 20, 2009 ML-PS #11: In a continued effort to eliminate any potential variables, all operating floats and ISR's in ML-PS #11 were replaced. All of these controls had been previously tested by an electrician and found to be good. Recent suspicions of intermittently failing controls in some of the pump stations have overrode normal troubleshooting reason.
- Friday November 20, 2009 BCL-PS #17: Pump #2 from BCL-PS #17 was MEGGED to verify that the pump motor was good. Pump exhibiting signs of another plug, despite the new cutters installed on November 3, 2009. Pump removed again on Tuesday November 24, 2009 to be serviced by FixAll Electric.
- Tuesday November 24, 2009 ML-PS #9: Pump #1 from ML-PS #9 was removed from the pump station and found the motor/pump unresponsive to the electrical controls. Suspected that the motor stator is bad. Brought to FixAll Electric for additional troubleshooting and repair.
- Wednesday November 25, 2009 5MILE-PS #3: Pump #2 was replaced with a re-built 10HP pump recently constructed from a combination of salvaged parts of non-working pumps. Additional time was spent with the undersized electrical conduit from the panel to the station. Additional adjustments to the impeller and wear plate clearances will be made within a week to maximize the pump's discharge capacity.
- Wednesday November 25, 2009 ML-PS #6: GrandTech replaced the Pump-Off, Lead Pump-On, and Lag Pump-On Intrinsically Safe Relays (ISRs) with new Diversifieds [brand]. The Low Level ISR utilizes a new Warrick [brand] and the High Level ISR remain unchanged with the existing Warrick ISR. The pumps were cycling as designed and the alarm light was not engaging. The alarm light housing was repaired (due to heat damage from the light being on too long).

### **Pending Projects:**

- The pumps at ML-PS #11 and RL-PS #15 will be evaluated for increasing the pumping capacity of the station to maintain normal operation levels during spike flows.
- The unreliable controls in ML-PS #6 will be replaced with a Motor Pump Controller operating from a pressure transducer with float switches for redundancy in both alarms and controls.
- A new swing-check valve being re-built by Al Evink of Maintech for Irrigation Pump #2 at the Grattan/Vergennes Plant. The weighted portion of the swing check had fallen apart within the valve body periodically constricting flow from the irrigation pump.